



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/605,610	10/13/2003	Donald J. Delehanty	FIS920020214	2609
32074	7590	08/31/2006		
INTERNATIONAL BUSINESS MACHINES CORPORATION DEPT. 18G BLDG. 300-482 2070 ROUTE 52 HOPEWELL JUNCTION, NY 12533				
			EXAMINER GEORGE, PATRICIA ANN	
			ART UNIT 1765	PAPER NUMBER
DATE MAILED: 08/31/2006				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/605,610

Applicant(s)

DELEHANTY ET AL.

Examiner

Patricia A. George

Art Unit

1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 1 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 February 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 and 22-24 is/are pending in the application.
- 4a) Of the above claim(s) 4 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-18 and 22-24 is/are rejected.
- 7) ☒ Claim(s) 9-11 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☒ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

The office action filed, 5/4/06 is replaced with this action, because claims 22-24 were not addressed in the prior action. Examiner would like to thank applicants' representative for pointing out this error, and apologizes for any inconvenience caused to applicants as a result. Please see Interview Summary (enclosed) for complete details.

Response to Amendment

The amendment of claim 1, further limiting the liquid medium, filed on 02/09/2006 is sufficient to overcome the 102 reference of Gorantla (2004/0127045).

The amendment of claim 9 is sufficient to overcome the claim objection presented in the office action dated 10/06/2005. The objection to claim 9 is withdrawn, as applicant's modified the claim as dependent only on claim 8.

Claim Objections

Claim 6 is objected to because of the following informalities: Claim 6 has two periods at the end of the sentence. Appropriate correction is required.

Claim 9 objected to because of the following informalities: The identifier of amended claim 9 should be -- (currently amended)-- because applicants amendment of 09/22/2006, modified the claim dependency. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 3, and 5-18, are rejected under 35 U.S.C. 103(a) as being unpatentable over Gorantla et al. (US 2004/0127045) in view of Prasad of US 6,913,517.

Gorantla et al. discloses a method of polish that uses an aqueous composition for the CMP of a film which uses a fixed polishing pad (para.16). In figure 2, (and described in paragraphs 29-31) Gorantla illustrates the composition (23) between the pad (22) and the wafer surface (20), with pH of between 3 and 5 or between 9 and 12 (para.18). In paragraph 44, Gorantla teaches chemistry of maintaining the pH and that it is maintained by lowering or raising through use of agents such as acids and bases, including ammonium or potassium hydroxide and stabilizers such as amino acids (para.25, l.13). See the arrow in figure 2, which illustrates Gorantla's teaching of the wafer moving relative to the pad.

Gorantla et al. does not teach the use of a carbonate, as in claim 1.

Art Unit: 1765

Prasad teaches carbonate is provided, as in claim 1, through the pours of the pad, into the liquid medium i.e. slurry (col.9, l.8), which is written on "by adding said carbonate salt to said liquid medium" as in claim 11.

Gorantla does not teach slurry stabilizers, as in claim 6.

Prasad teaches slurry comprise water soluble particles, and the use of slurry stabilizers, such as polyacrylic acid (col.9, l.17), as in claim 6; and potassium carbonate (col.9, l.22), a carbonate salt of alkali earth metals as in claims, 9 and 10.

It would have been obvious to one of ordinary skill in the art at the time of invention was made, to use the water soluble particles, of Prasad, when using a method of polishing, as Gorantla, because Prasad teaches pads which can be produced at a low cost, and require little to no conditioning after installation, which improve the process and save money.

As to claim 3, Gorantla teaches polishing is performed with a fixed abrasive polishing pad (para. 11, l.7-8).

As to claim 5, see discussion toward claim 1 above.

As to claims 7, and 8, see discussion toward claim 1 above.

As to claim 12, Gorantla teaches a fixed abrasive component of said polishing pad includes alumina, and ceria (see example 7, SWR 159, 176, and 192 are made of both alumina and ceria particles.).

As to claim 13, Gorantla teaches a polishing pad is moved in a linear direction relative to said substrate (para.31).

As to claims 14 and 15, Gorantla teaches the substrate consists of an oxide-filled Shallow Trench Isolation structure (para.24), that has silicon nitride (para. 24, l.7 and fig. 1, 13) underlying the top silicon dioxide (para.24, l.13 and fig.1, 15) layer. The excess oxide is removed and the trench planarized (para.6, l.9-13), and the silicon nitride acts as a stop layer (para.7, l.3), which is written on polishing is performed to expose a second layer underlying said first layer, as in claim 14, and first layer comprises an oxide of silicon, said second layer comprises silicon nitride and said polishing is performed until said first layer is planarized to a level of said second layer, as in claim 15.

As for claims 16 – 18, all limitations are discussions above.

Claim Rejections - 35 USC § 103

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gorantla et al. (US 2004/0127045) and Prasad, as applied to claims 1, 3, 5-8, and 12-18 above, further in view of Wang et al. (US 6,316,365).

As to claim 2, Gorantla et al. teaches the use of potassium hydroxide, a known base, to control the pH (see para. 66), and the first layer includes an oxide (layer 11 of figure 1, and para. 24).

Although Gorantla et al. teaches it is preferred not to include amino acids, traditionally employed, for planing wafer topography, Gorantla et al. is silent as to the use of amino acids as a stabilizer.

Wang et al. teaches the use of amino acids as surfactants, i.e. stabilizer, as applicants' claimed limitation (col.6, line 34).

It would have been obvious to one of ordinary skill in the art at the time of invention was made, to modify the invention of CMP, as Gorantla et al., to include the use of amino acids as surfactants, because the reference of Gorantla et al. leaves the door open for the use of amino acids for reasons other than planing, as the reference of Gorantla et al. specifies it is preferred not to use amino acids specifically for planing.

Claim Rejections - 35 USC § 103

Claims, 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gorantla et al. (US 2004/0127045) and Prasad, as applied to claims 1, 3, 5-8, and 12-18 above, further in view of Luo et al (2002/0043026).

The combined teaching of Gorantla et al. is silent as to the quantity of carbonate ions as in applicants' claims 22-24.

Luo teaches a method of polishing a layer, providing a composition which comprises carbonate salts (para. 0018) added in quantity not to exceed 15 wt% (para. 0018), which encompasses applicants ranges of claims 22-24.

It would have been obvious to one of ordinary skill in the art at the time of invention was made, to include the quantity of carbonate ions, as Luo et al., when using the polishing method of Gorantla et al., because Luo teaches quantities of carbonate ions that are known to be effective for CMP methods.

Response to Arguments

Applicants' argue, on page 7, the basis for the objection to claim 9. Examiner has withdrawn the claim objection, because of applicants' amendment to the claim.

Applicants argue, on page 8, that Gorantla neither teaches nor suggests a liquid medium which contains a carbonate. Examiner agrees, and also would like to direct applicants to the reference of Prasad, above, which teaches carbonate is provided (see column 9, line 8).

Applicant's arguments filed 9/22/06 have been fully considered but they are not persuasive because Applicant's amendment necessitated the new ground(s) of rejection presented above.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire ONE MONTH from the mailing date of this action.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: US 20030219982 teaches use of water-soluble polymers, for CMP, such as: L-proline, glycine, lysine, and polyacrylic acid.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patricia (Patty) George whose telephone number is

Art Unit: 1765

(571)272-5955. The examiner can normally be reached on weekdays between 7:00am and 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Patricia A George
Examiner
Art Unit 1765

PAG
04/06

NADINE NORTON
SUPERVISORY PATENT EXAMINER
ART UNIT 1765
